ATV32 ATV Logic

Motion & Drives *Training*

ATV32 ATV Logic

Summary

- Objectives
- **What is ATV logic ?**
- The function blocks
- Programming
- Scrolling poster demo
- Quiz

ATV Logic

Main features

- Why ATV logic ?
  - **It allows customers to write their own small application inside ATV32.**
  - **It extends the ATV customization capabilities**

- ATV Logic interacts with:
  - **The drive core control**
  - **The Inputs/Outputs**
  - **The communication buses**
  - **The HMI**

- ATV Logic programming
  - **With Somove software (VSD software)**
  - **A set of Function blocks (FBD) instruction**
  - **Boolean, arithmetic operations, timers, counters, comparators …**

Summary

Comparing of 2 solutions

PLC

Zelio
SR3B261BD

SR3 MBU01BD

HMI

XBT N401
XBT Z938

Drive

ATV312
0.18Kw

Safety

Cont
actor

Preventa

Integrated solution
ATV logic + safety

617€ price list
+ cabling 2 hours

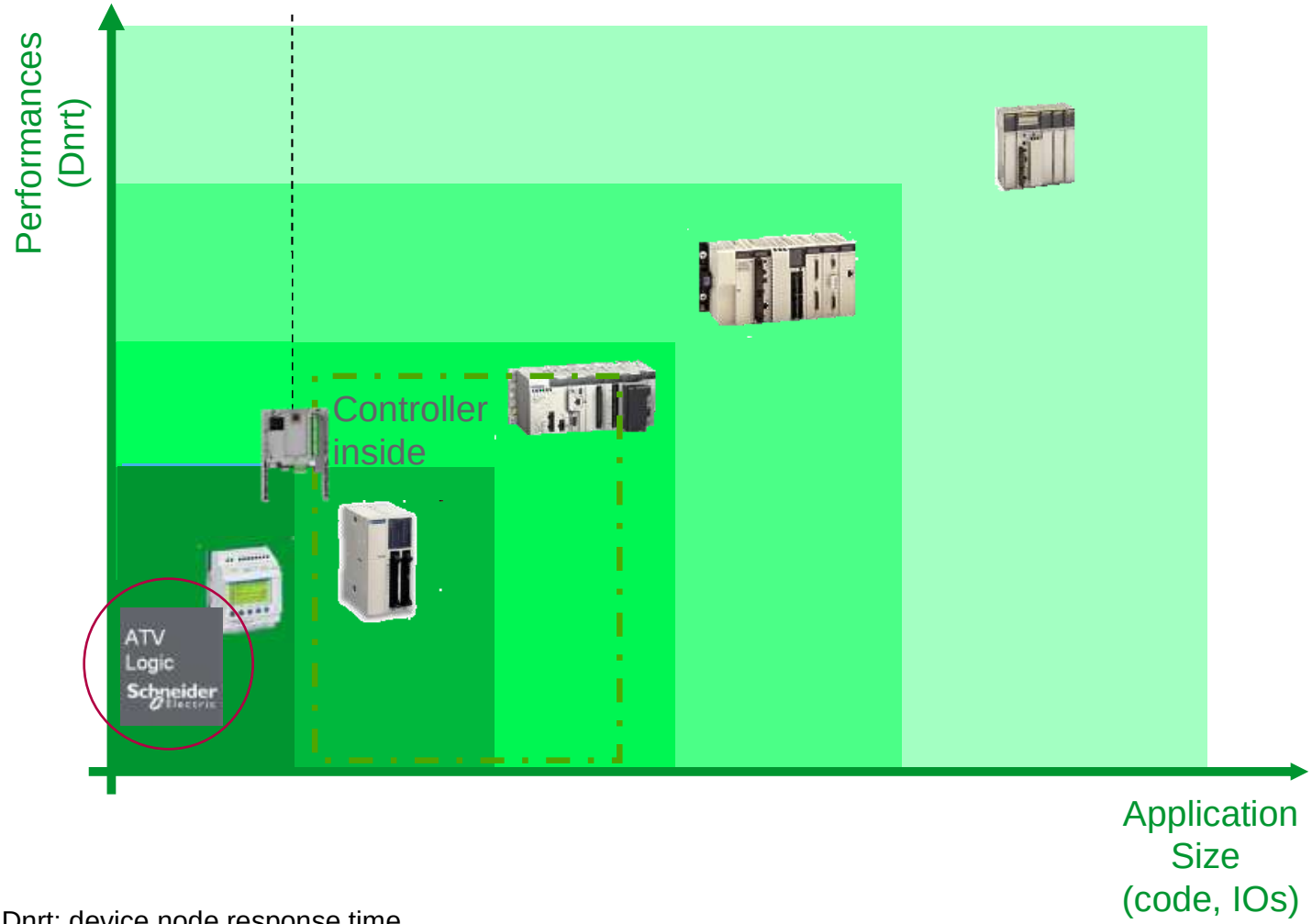
Modular solution

969€ price list
+ cabling 1 day

Summary

ATV Logic

Position on controllers market

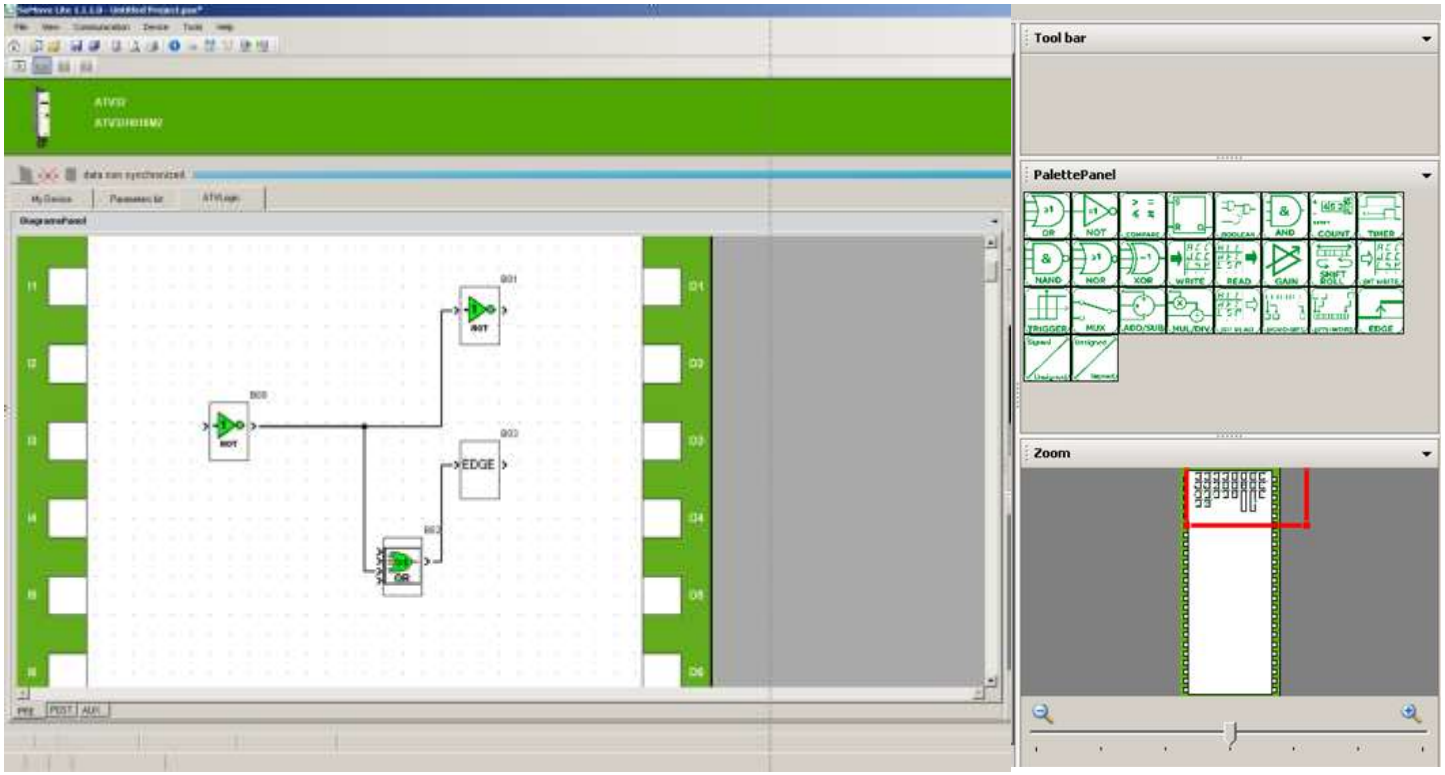


Dnrt: device node response time

ATV Logic

Language FBD under SoMove

- Easy programming language with function block diagram (FBD)



Summary

ATV Logic
Performances

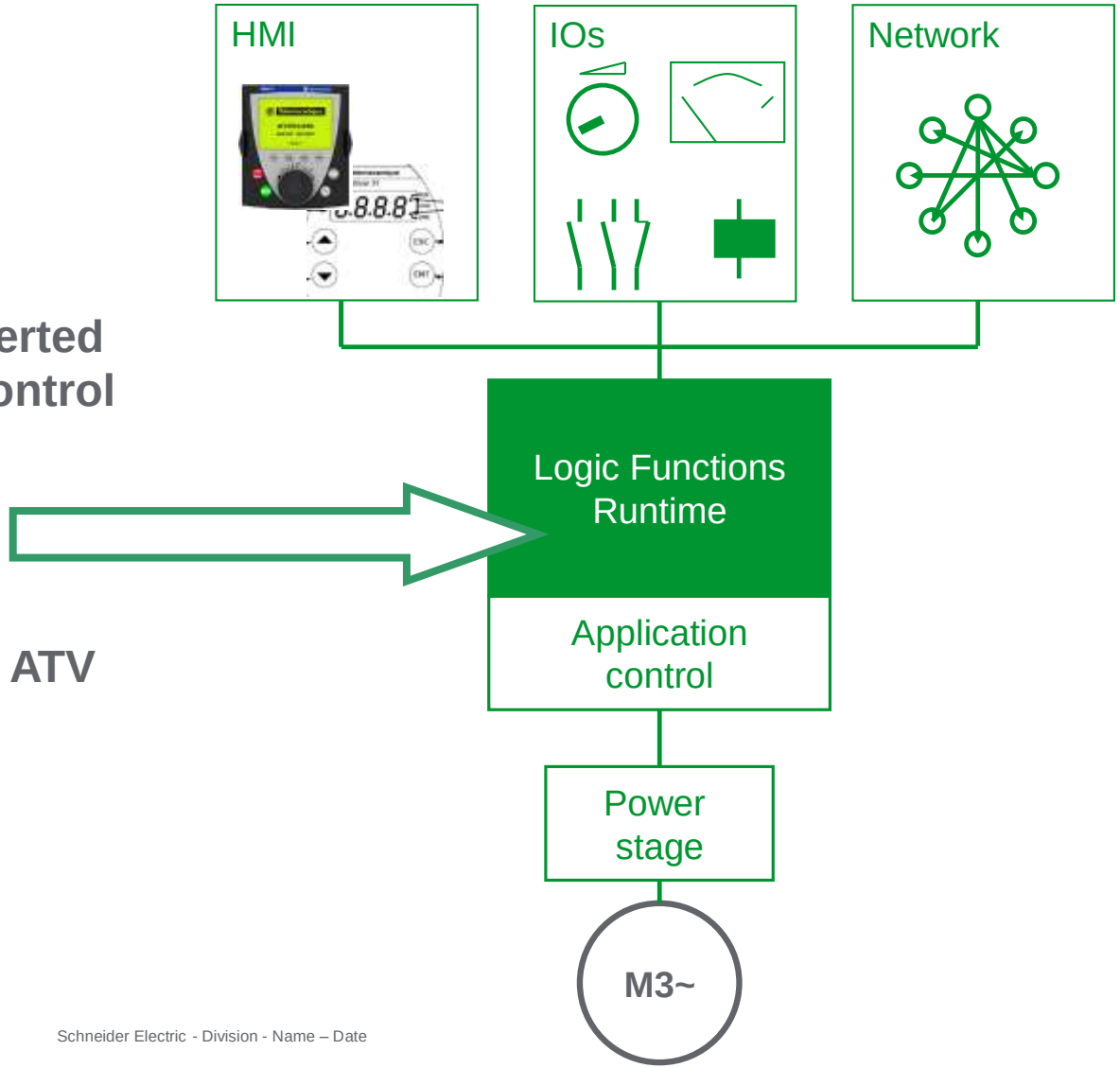
- 30 different function blocks
- HMI customizable menu with up to 8 dedicated parameters
- All drive I/O and more useful parameters and communication accessible
- 3 tasks, 2 synchronized and 1 auxiliary
- Cycle time 2ms (sync with ATV)
- Max function blocks 10 (sync task)
- More in auxiliary task (up to 50)
- 8 Internal Word (%MW)
- System bits (%S), (timer, save conf ..)

ATV Logic

Interactions

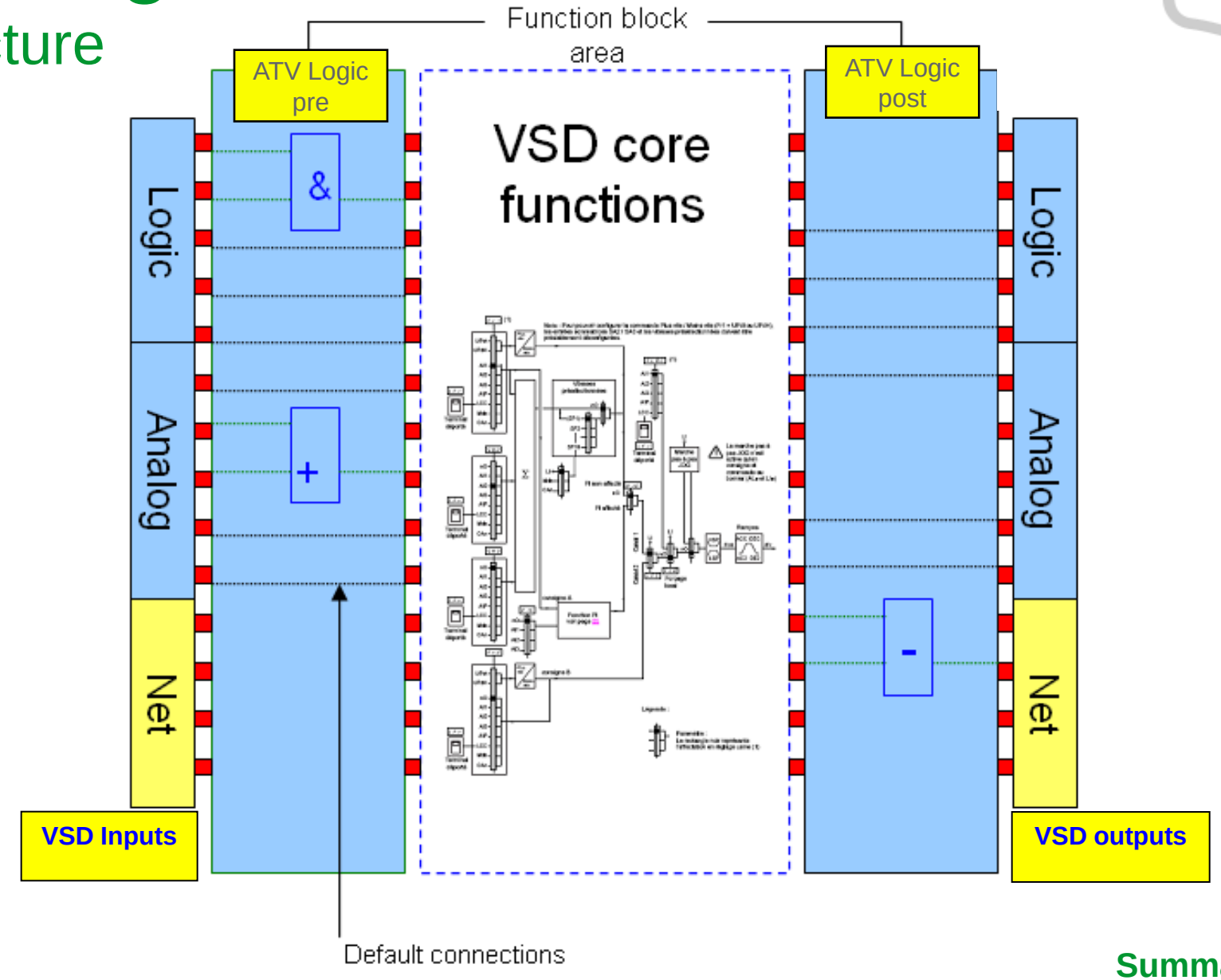
ATV Logic overlay is inserted between the core VSD control and its periphery

It comes in addition with ATV native functions



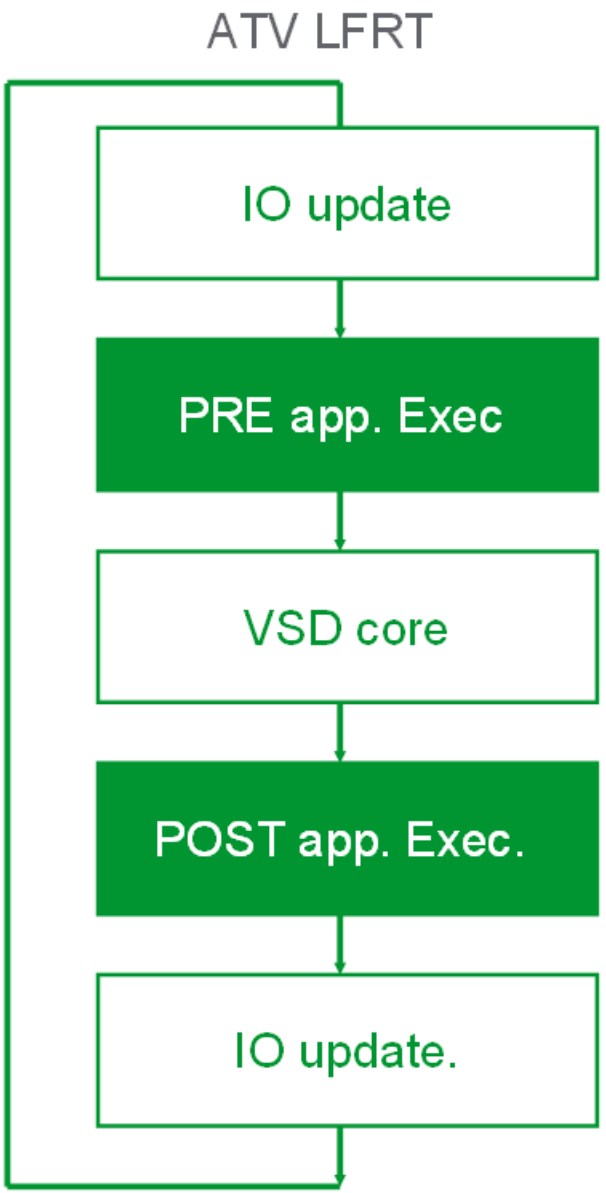
ATV Logic

Achitecture



ATV Logic

Cycle



Summary

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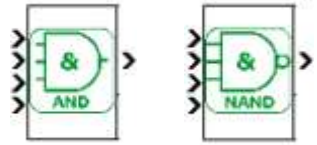
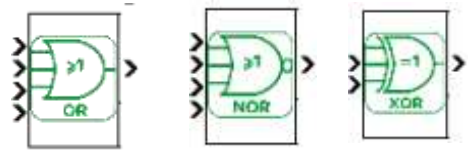
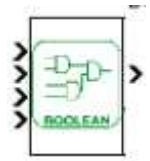
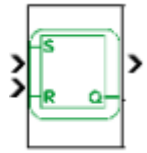
ATV Logic

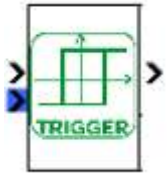
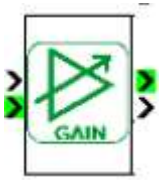
Functions

Not		Not function on a boolean
And, Nand		And and Nand on 4 Booleans
Or, Nor, XOR		Or, Nor on 4 bouleans Xor on 2 bouleans
Compare		Compares two signed 16 bits words >, <, =, not =
Boolean Operator		Gives the value of the output according to the combination of inputs. The function has four inputs, and therefore 16 combinations
Set, Reset		The Set input sets the Q output to the true logical state The Reset input sets the Q output to the false logical state

Summary

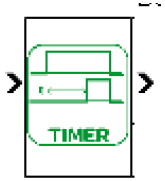
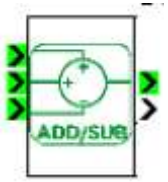
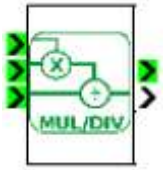
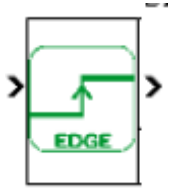
ATV Logic

Functions

Up/down count		Count up, Count down, Reset Preset inputs, Preset parameter (signed) Logical output ,Actual value
Mux		The Multiplexing function carries out two input channel multiplexing on the Output.
Trigger		Allows an analog value to be monitored relative to two thresholds. The output changes state if : •The input value is less than the minimum value •The input value is greater than the maximum value.
Gain		Enables analog values (16 bits signed words) to be converted by changing the scale and offset Output = (Input value x (A/B)) + C Used for scalling

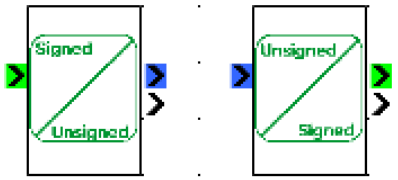
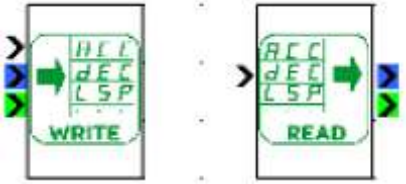
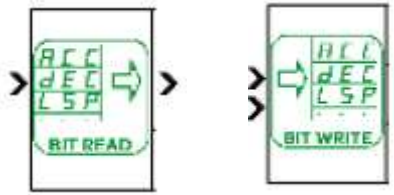
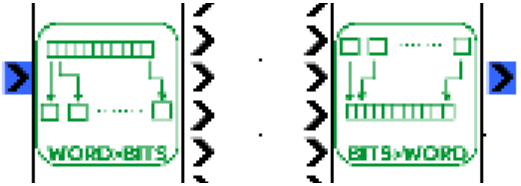
ATV Logic

Functions

Timer On/Off		The Timer function is used to delay, prolong and control actions over a predetermined time. The A function: timer on-delay, or timer active, •The C function: timer off-delay, or timer idle, •The A/C function: combination of functions A and C.
Add/Sub		Output value = Input A + Input B – Input C. (A,B,C and output value are 16 bits signed words)
Mul/Div		Output value = (Input A x Input B)/Input C. (A,B,C and output value are 16 bits signed words).
Edge		The function detects falling, rising or both edge(s) of a signal.

ATV Logic

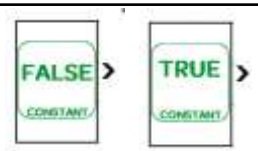
Functions

Signe		Convert word Signed to not signed, Not signed to signed Signed input range: -32768 to +32767. Unsigned output range: 0 to 32767
Read/write parameter		Read / write drive parameter Ex Acceleration Use the ADL containers to link with the parameters of the drive
Read a parameter bit		Read/write a bit in a drive parameter word. Ex Fault in status word STA Use the ADL containers to link with the parameters of the drive
Shift Roll		Allows to shift or rolls to the left/right the IN value of a fixed number of bits
Word to bit Bit to word		Transfer a contiguous bit string (Bitx to Bitx+16) to a 16 bits word. Transfer a a 16 bits word to a contiguous bit string (Bitx to Bitx+16)

Summary

ATV Logic

Functions

Internal variables	8 %MW, 5%Sx	8 internal words used also for the keypad FBD menu 5 system bits, time base, store conf.
Drive I/O		LI, AI, LO, AO
Contant		Input of constant value
True/False input		Input of boolean values

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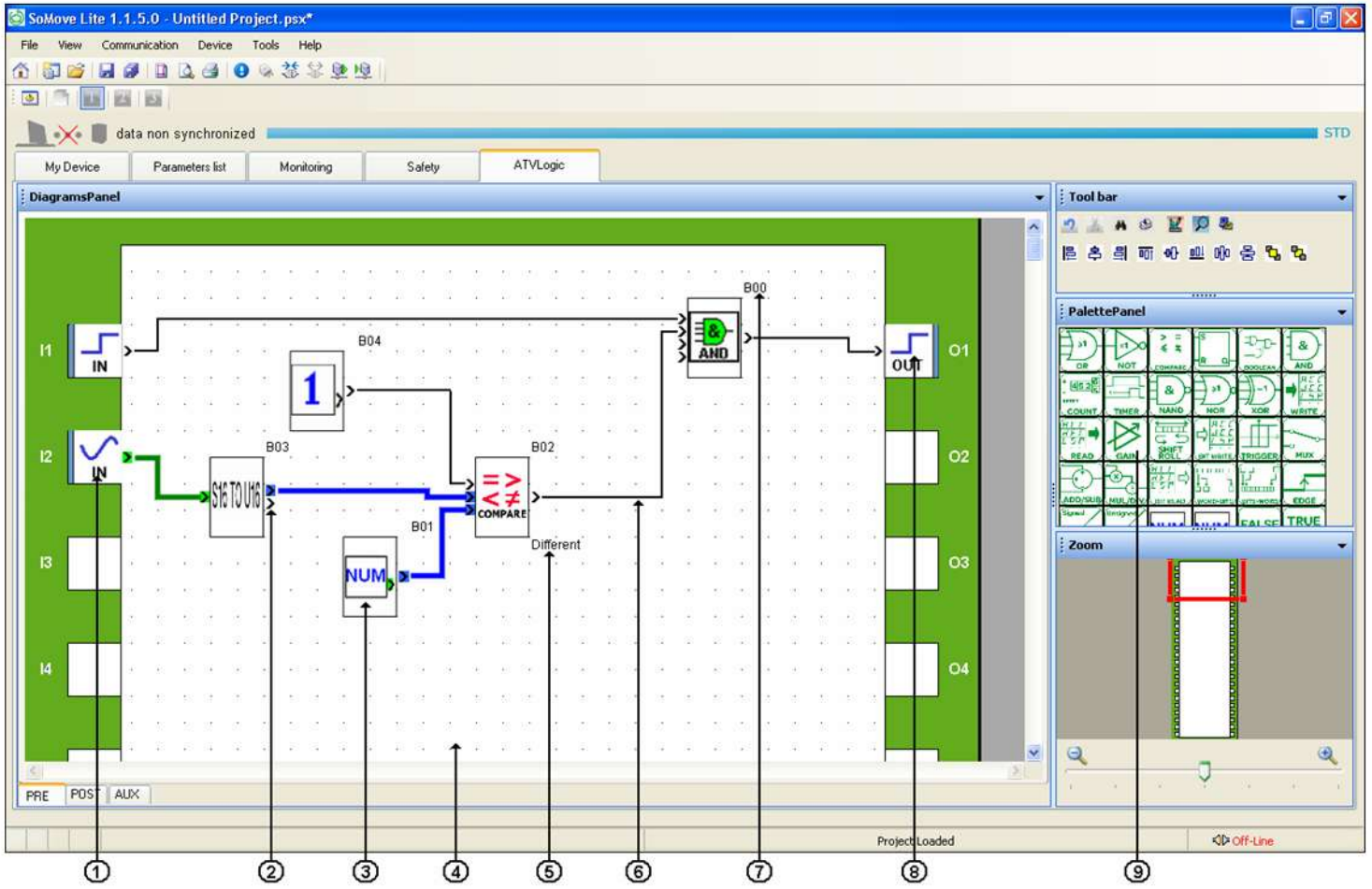
Working platform in SoMove

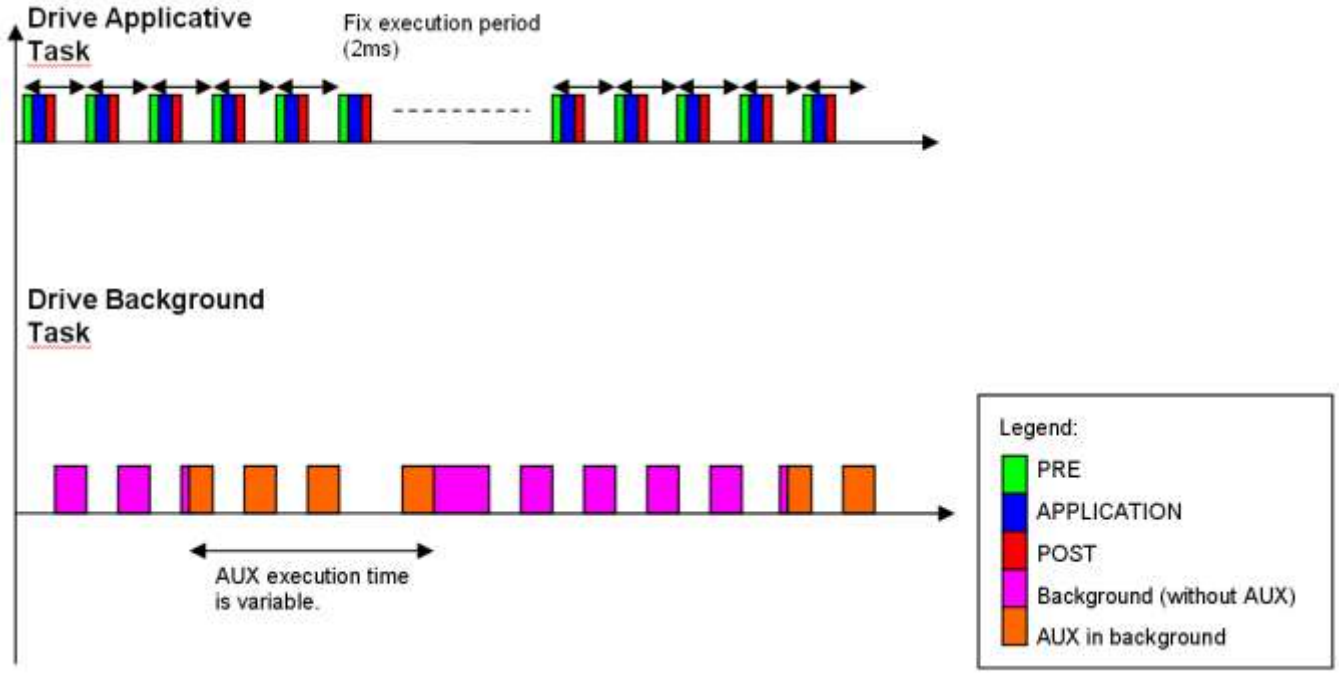


1. Function Block input zone.
2. Connection.
3. Function block.
4. Wiring sheet.
5. Comments.
6. Links between two function blocks.
7. Function blocks number.
8. Function block Output zone.
9. Palette panel.

Summary

ATV logic Tasks

Pre	The PRE task is executed in priority before Drive task, used to set inputs and motor control. Cycle = 2ms synchronised
Post	The Post task is executed in priority after Drive task, used to feedback motor parameter status. Cycle = 2ms synchronised
Aux	The AUX, used to execute long background task with no priority. Cycle depends on program length and drive priority task

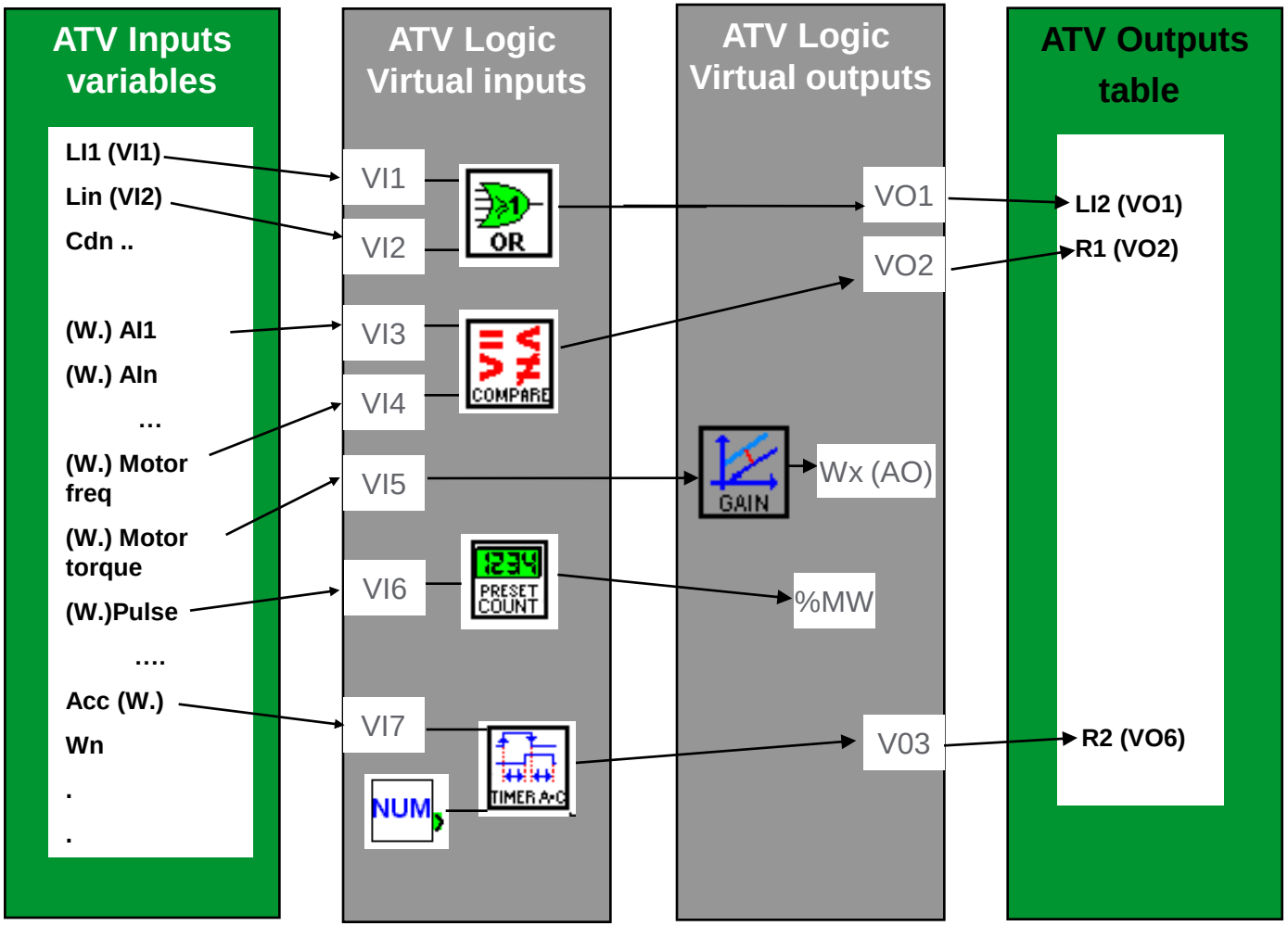


Summary

Principal of assignment

Virtual inputs are assign to a drive variable like for any other functions

Select the virtual input (Vix) in the ATV logic menu then assign a LI or the Word corresponding to an ATV variable



Virtual outputs are assign to a drive variable like for any other functions

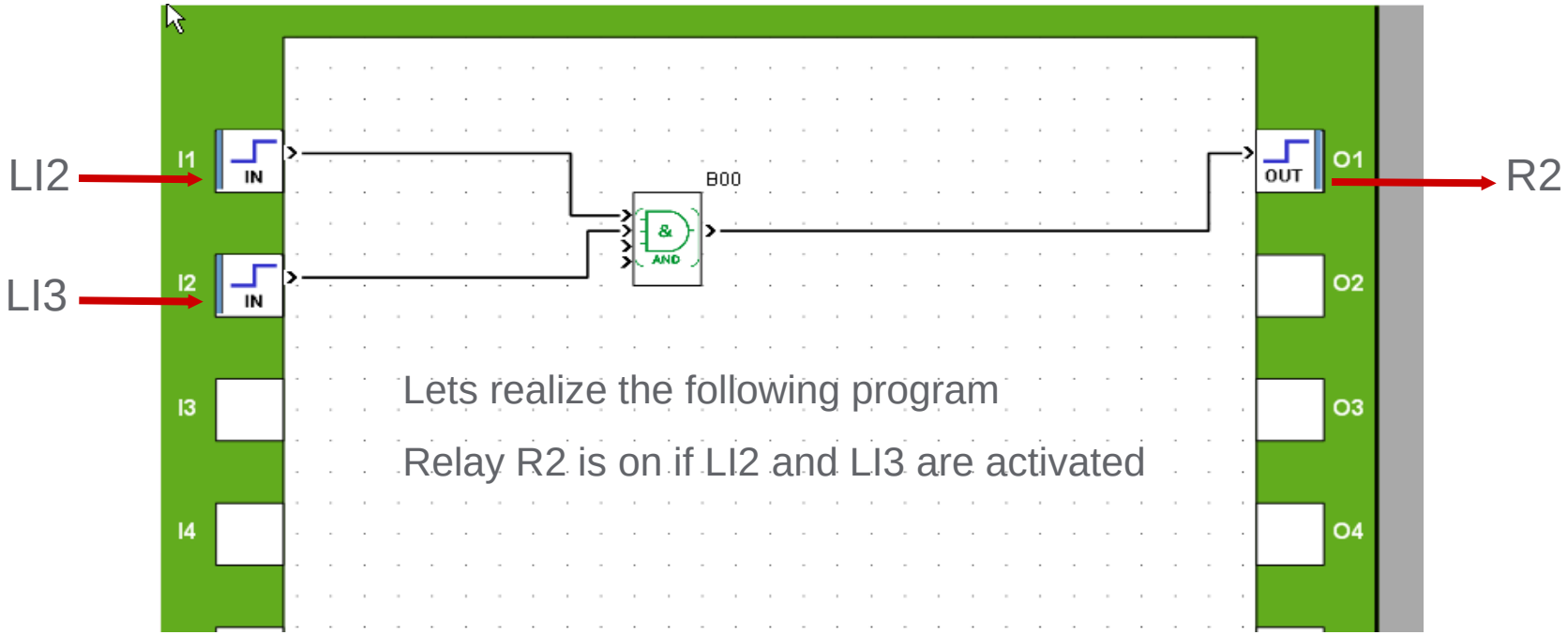
Select the drive function (Rx) in the ATV I/O menu then assign the virtual output (VOx)

Or send the output of a block directly to a Word

Summary

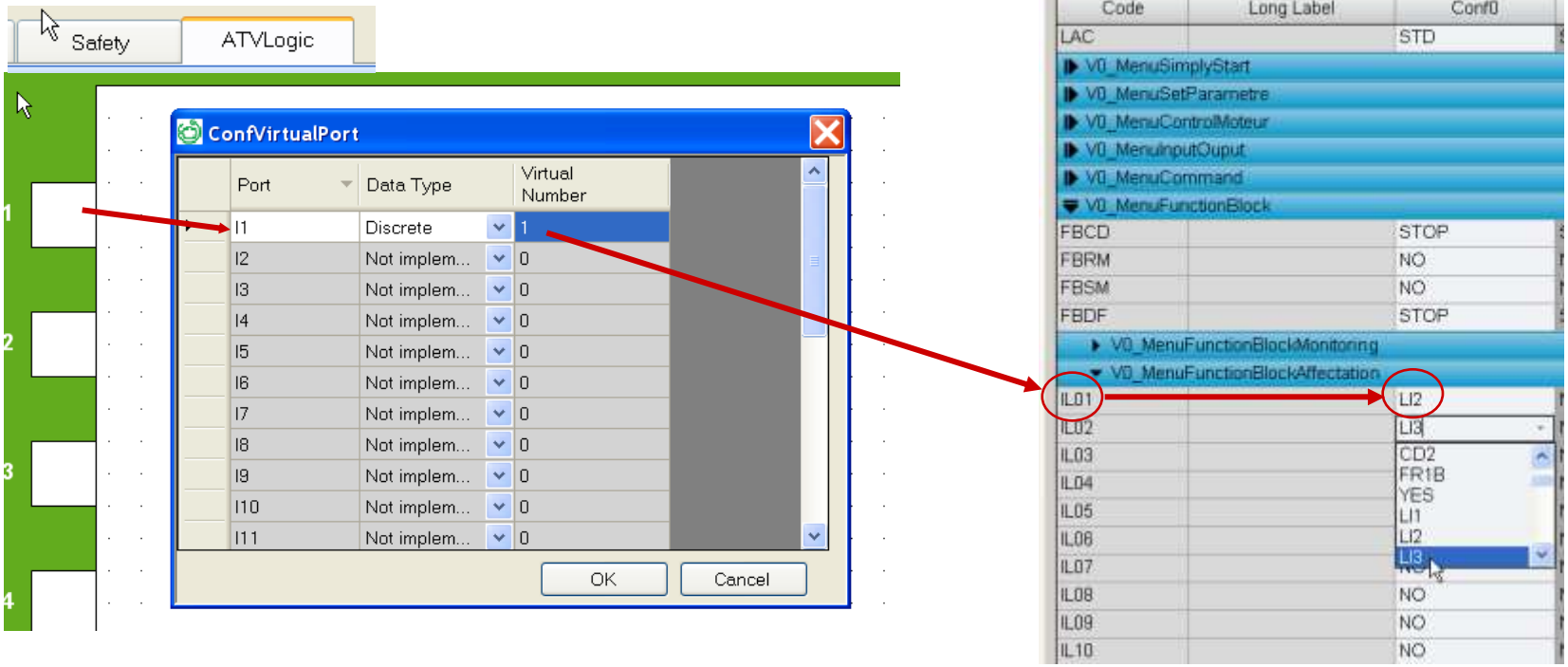
I/O managment

- **Each task can use up to 10 virtual inputs (Ix) and outputs (Ox)**



I/O managment

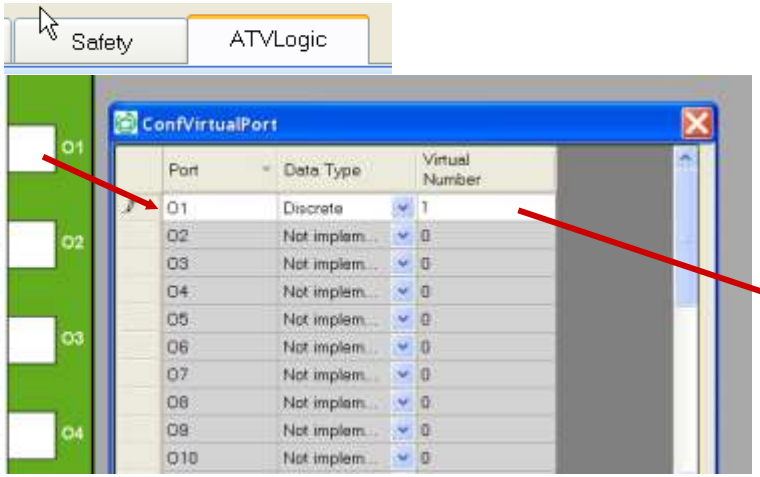
- To be used the **virtual input** have first to be **assign to a physical Logic Input** of the drive
- This is done in the menu "**Function block - Affectation**"

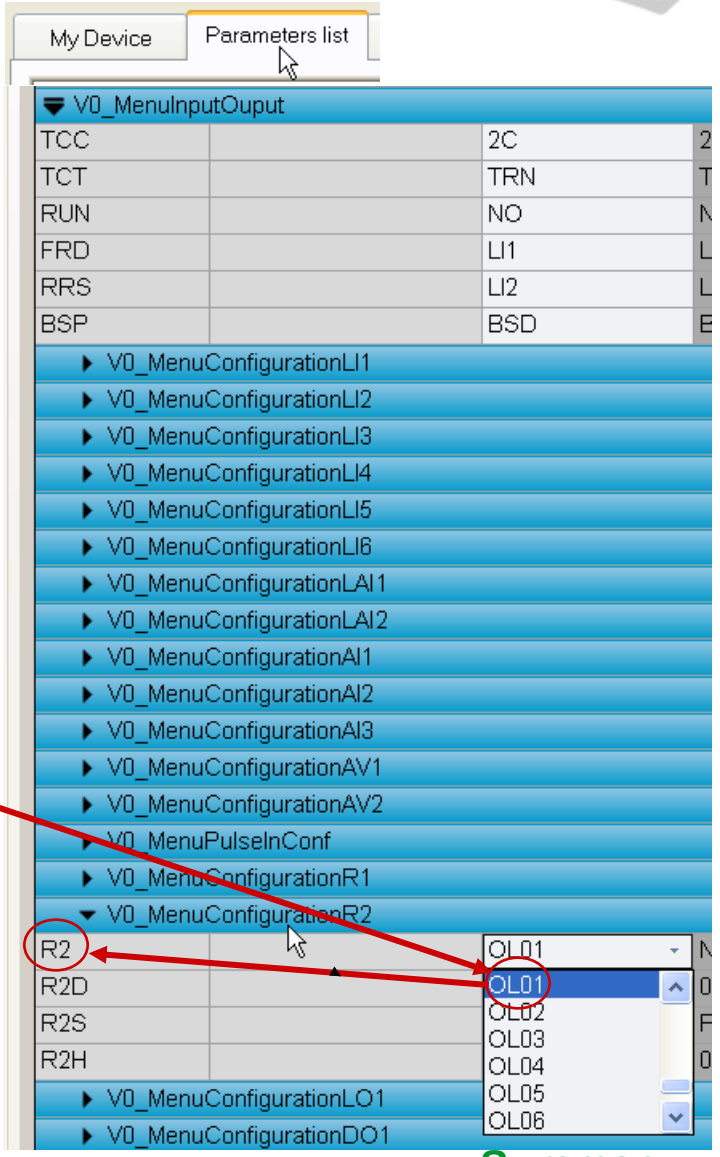


Summary

I/O managment

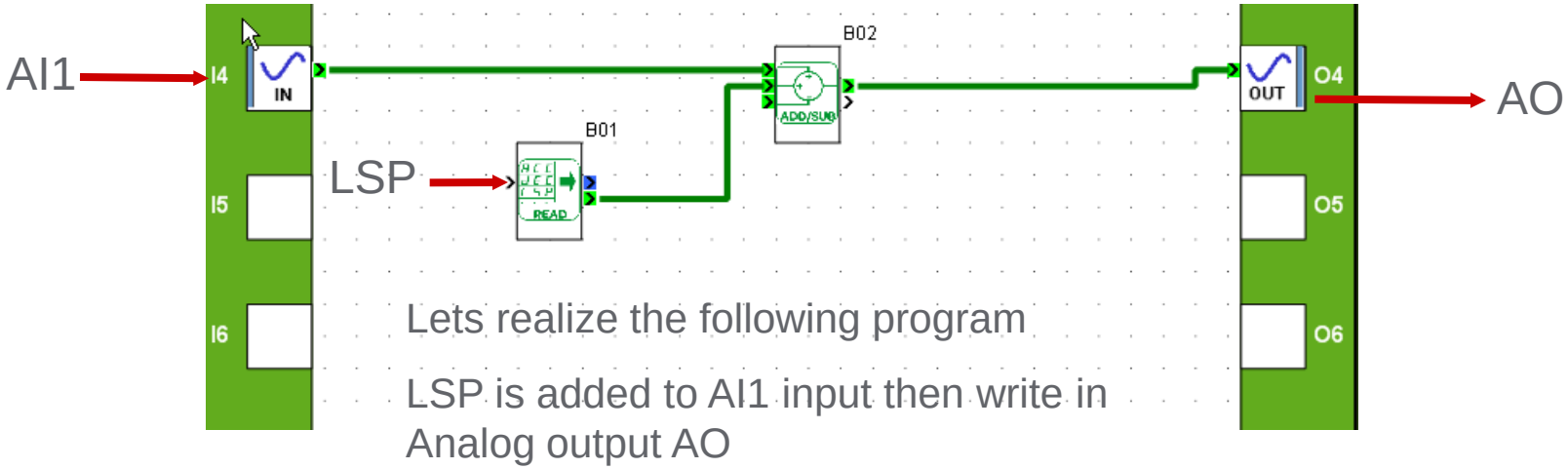
- To be used the **virtual Output** have first to be **assign to a physical Logic Output** of the drive
- This is done in the menu "**Input output - Configuration**"
- Like a classical assignment of an output





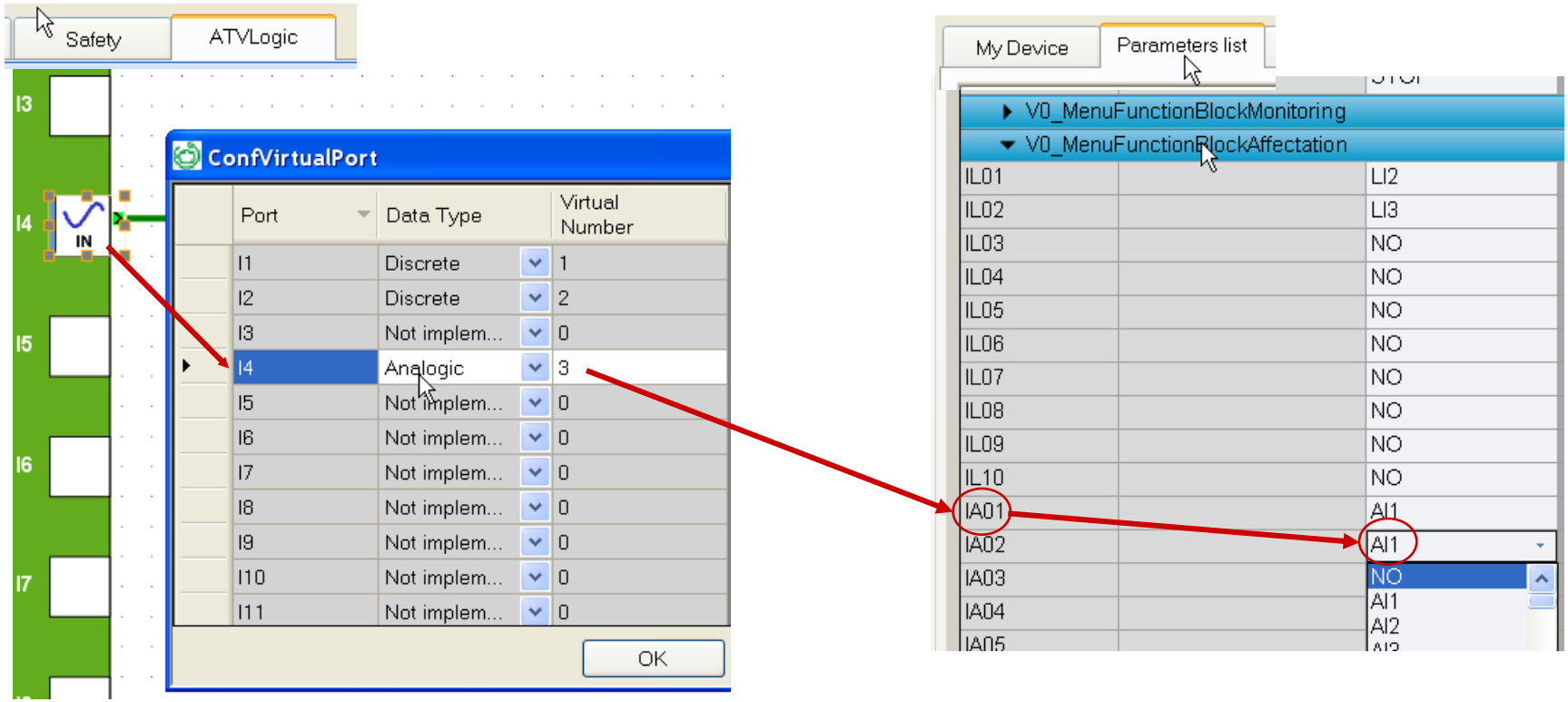
Summary

I/O managment



I/O managment

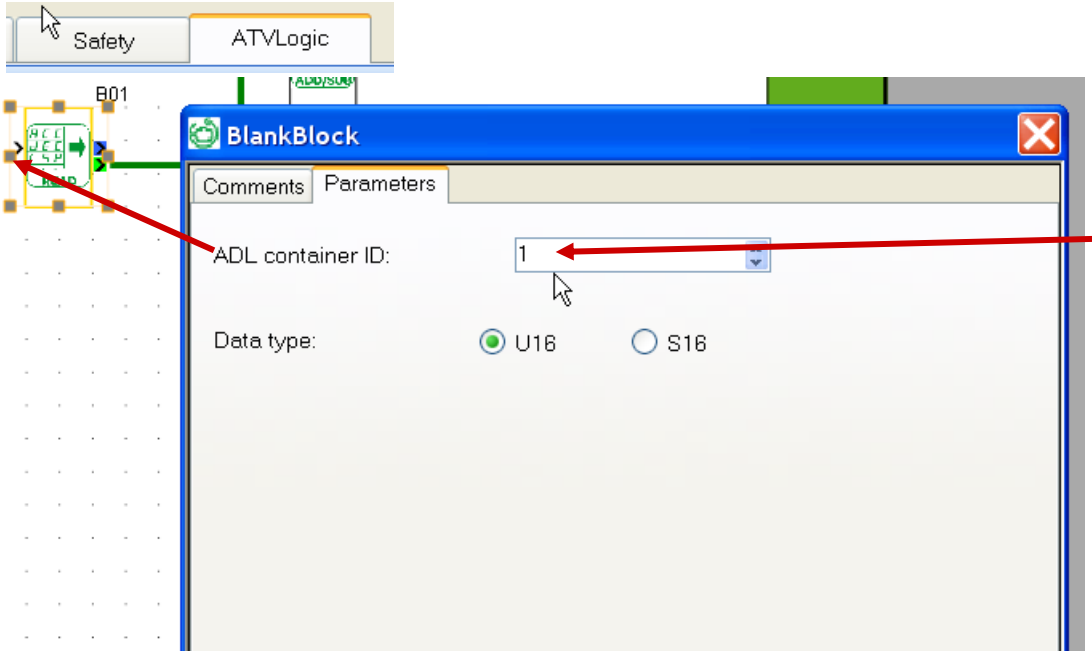
- To be used **virtual analog input** have first to be **assign to a physical Analog Input** of the drive
- This is done in the menu "**Function block - Affectation**"

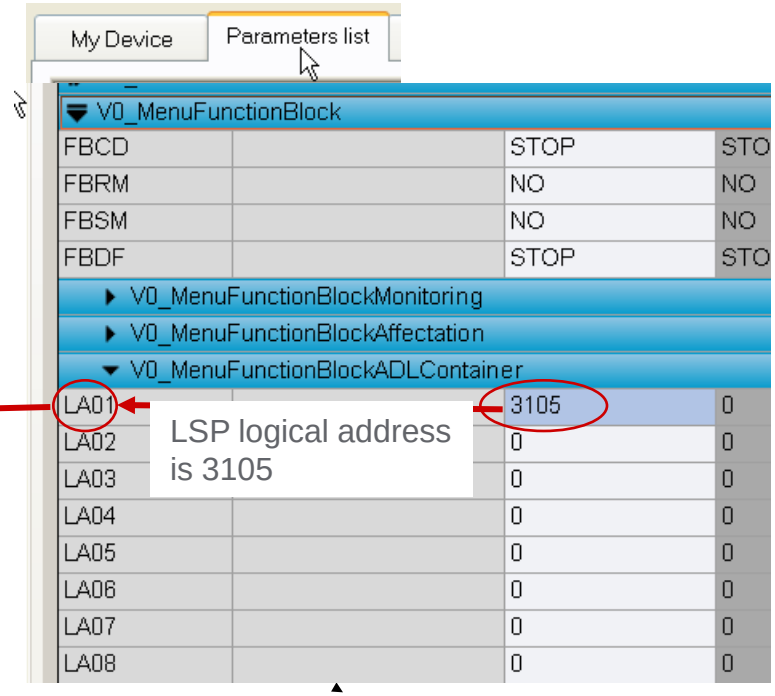


Summary

I/O managment

- To be used **the parameter input** has first to be **assign to a ADL container (up to 8)** of the drive
- Then the logic address of the parameter is put in the container in menu "**Function block – ADL Container**"
- Like a classical assignment of an output

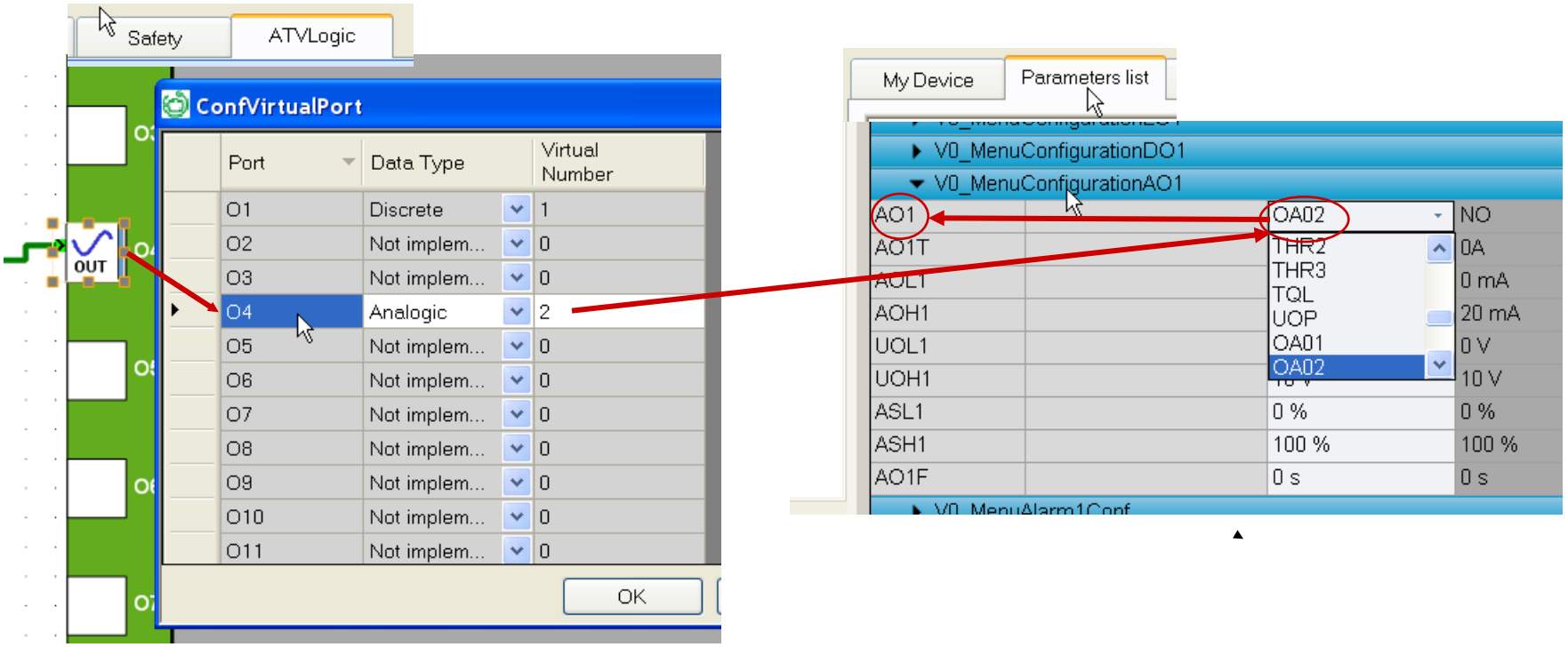




Summary

I/O managment

- To be used the **virtual analog output** has first to be **assign to a physical Analog Output** of the drive
- This is done in the menu "**Input output – Configuration AO1** "
- Like a classical assignment of an output



Summary

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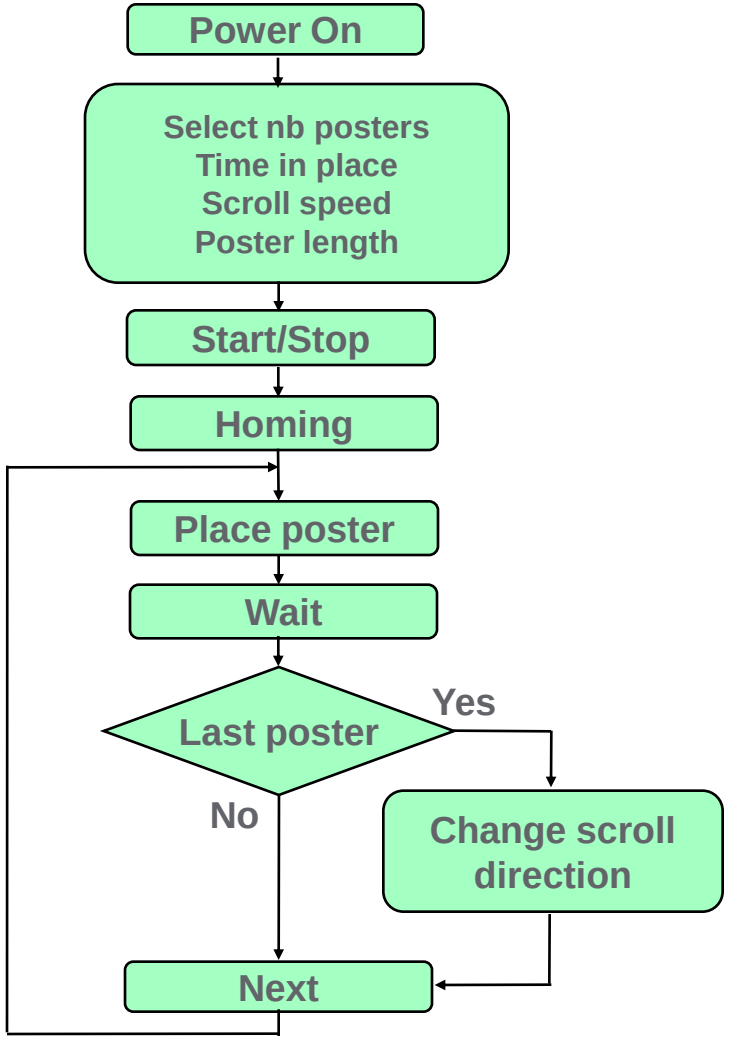
ATV Logic

Stand alone applications



ATV Logic

Stand alone applications

Normal sequence

Safety functions

ATV32

STO

Safe speed

Power On

Select nb posters
Time in place
Scroll speed
Poster length

Start/Stop

Homing

Place poster

Wait

Last poster

Yes

No

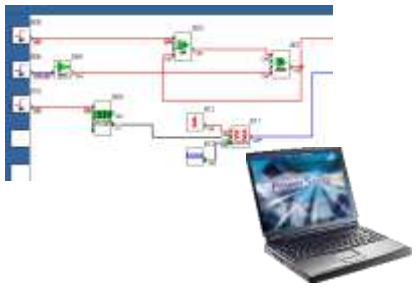
Change scroll direction

Next

ATV32

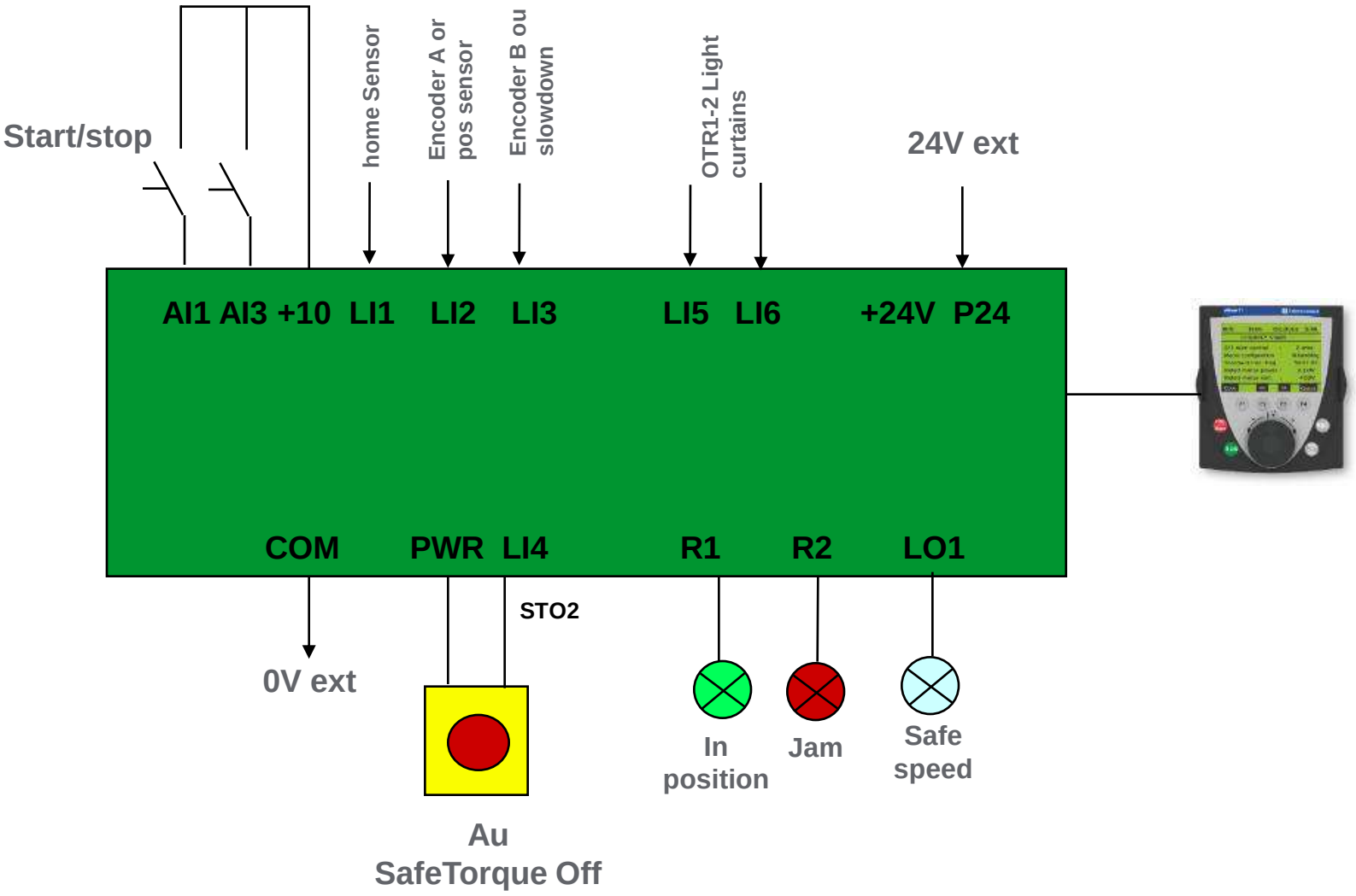
Jam detection
Torque limitation + delay

+ Auto-Manu

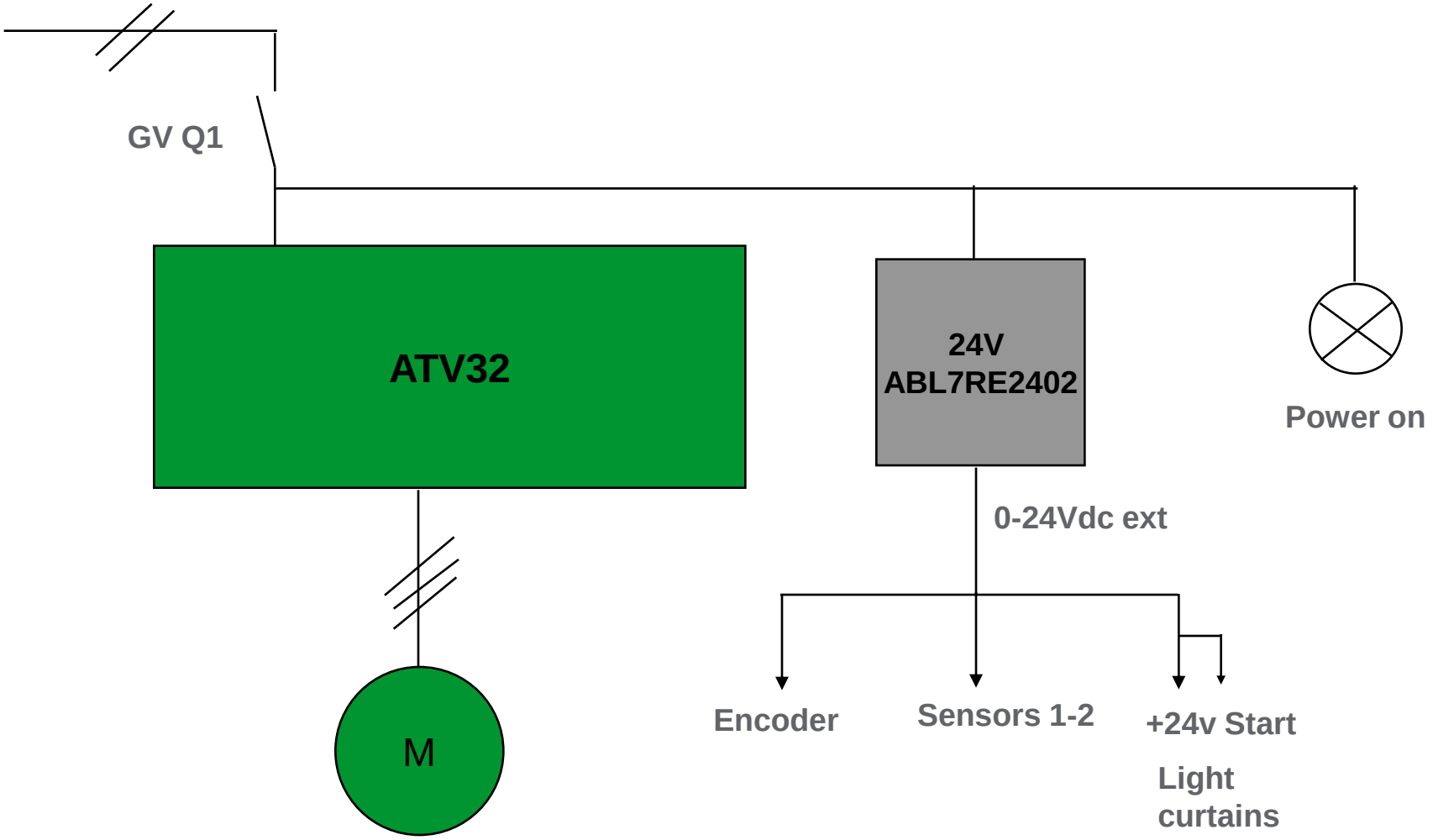


Summary

Control diagram



Power diagram



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- **Quiz**

Quiz

- Why ATV logic ?
  - **It is made to adapt or enhance ATV32 embedded functions**
- What is ATV logic ?
  - **It's a programming tool which allows to make little automation sequence in ATV32**
- What are the programming software and language ?
  - **Function block (FBD)**
  - **SoMove**
- What is the minimum cycle time
  - **2mS in POST an PRE synchronised task**
- How many blocks can I put in a synchronised task ?
  - **10 max to ensure 2mS cycle time**
- ATV logic is a competitor for other =S= PLC
  - **No it is not designed for that it is less performing than a Zelio**

Title of the training module

Questions and Answers

Thanks!

Make the most of your energy